



PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re U.S. Patent No. 6,909,190 B2

Application of: Uglow et al.

Application No: 09/788,105

Filed: February 16, 2001

For: DUAL DAMASCENE DIELECTRIC  
STRUCTURES

Issued: June 21, 2005

Docket No: LAM1P106D

Date: August 31, 2006

CERTIFICATE OF MAILING

I hereby certify that this correspondence is being deposited with the United States Postal Service as First Class Mail in an envelope addressed to: Commissioner for Patents, P. O. Box 1450, Alexandria, VA 22313-1450 on August 31, 2006.

Signed:

Melinda M. Ward

REQUEST UNDER 37 CFR 3.81(b) FOR CORRECTION OF PATENT  
TO STATE NAMES OF ASSIGNEES

Mail Stop: Petitions  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Dear Sir:

Under 37 CFR 3.81(b), this is a request for correction of Patent Number 6,909,190 B2, to add Novellus Systems, Inc. as an additional Assignee. The failure to include Novellus Systems as an additional Assignee on the PTOL-85B was inadvertent.

Attached is Form PTO-1050 (Certificate of Correction) in duplicate, one copy of which is suitable for printing, and a copy of the first page of the subject Patent. The exact page and line number where the errors are shown in the application file are as follows:

Page 1, Item 73, add –Novellus Systems, Inc., San Jose, California – after “Lam Research Corporation, Fremont, California”

Attorney Docket No. LAM1P106.D

1

U. S. Patent No. 6,909,190 B2

09/07/2006 MGE BREM1 00000075 09788105

01 FC:1464

130.00 OP

Also attached are copies of the Notice of Recordation of Assignment Document and a copy of the Corrected Assignment Recordation Cover Sheet. Please note in the Notice of Recordation of Assignment Document for the parent case, dated March 15, 2006, page 2, lines 4-12 shows the Assignees as -- Lam Research Corporation, Fremont, California and Novellus Systems, Inc., San Jose, California --.

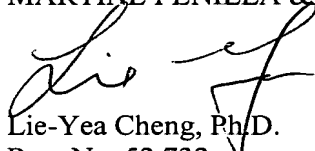
The fee set forth in Section 1.20(a) is enclosed. A check in the amount of \$130.00 is enclosed therewith in accordance with 37 CFR 1.20(a).

Please send the Certificate of Correction to:

Lie-Yea Cheng, Ph.D.  
MARTINE PENILLA & GENCARELLA, LLP  
710 Lakeway Drive, Suite 200  
Sunnyvale, CA 94085  
**Customer Number 25920**

The Commissioner is authorized to charge any additional fees that may be due to Deposit Account 50-0805 (Order No. LAM2P106D). A copy of this sheet is enclosed for this purpose.

Respectfully submitted,  
MARTINE PENILLA & GENCARELLA, LLP

  
Lie-Yea Cheng, Ph.D.  
Reg. No. 52,732

**Customer Number 25920**  
710 Lakeway Drive, Suite 200  
Sunnyvale, CA 94085  
Telephone: (408) 774-6924

# UNITED STATES PATENT AND TRADEMARK OFFICE CERTIFICATE OF CORRECTION

PATENT NO. : 6,909,190 B2

DATED : June 21, 2005

INVENTOR(S) : Uglow et al.

It is certified that an error appears or errors appear in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

Page 1, Item (73), add Assignee -- Novellus Systems, Inc., San Jose, California --  
after Lam Research Corporation, Fremont, California.

MAILING ADDRESS OF SENDER (Please do not use customer number

PATENT NO. 6,909,190 B2

No. of additional copies



# UNITED STATES PATENT AND TRADEMARK OFFICE

## CERTIFICATE OF CORRECTION

PATENT NO. : 6,909,190 B2

DATED : June 21, 2005

INVENTOR(S) : Uglow et al.

It is certified that an error appears or errors appear in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

Page 1, Item (73), add Assignee -- Novellus Systems, Inc., San Jose, California --  
after Lam Research Corporation, Fremont, California.

MAILING ADDRESS OF SENDER (Please do not use customer number

PATENT NO. 6,909,190 B2

No. of additional copies



(12) **United States Patent**  
Uglow et al.

(10) Patent No.: **US 6,909,190 B2**  
(45) Date of Patent: **Jun. 21, 2005**

(54) **DUAL-DAMASCENE DIELECTRIC STRUCTURES**

(75) Inventors: Jay E. Uglow, Livermore, CA (US);  
Nicolas J. Bright, San Jose, CA (US);  
Dave J. Hemker, San Jose, CA (US);  
Kenneth P. MacWilliams, Monte  
Serenio, CA (US); Jeffrey C. Benzing,  
Saratoga, CA (US); Timothy M.  
Archer, Portland, OR (US)

(73) Assignee: **Lam Research Corporation, Fremont,  
CA (US)**

(\*) Notice: Subject to any disclaimer, the term of this  
patent is extended or adjusted under 35  
U.S.C. 154(b) by 0 days.

(21) Appl. No.: **09/788,105**

(22) Filed: **Feb. 16, 2001**

(65) **Prior Publication Data**

US 2001/0010970 A1 Aug. 2, 2001

**Related U.S. Application Data**

(62) Division of application No. 09/346,156, filed on Jun. 30,  
1999, now Pat. No. 6,251,770.

(51) Int. Cl.<sup>7</sup> ..... **H01L 23/48**  
(52) U.S. Cl. .... **257/759; 257/758; 257/774**  
(58) Field of Search ..... **438/618, 622,**  
**438/623, 624, 627, 637, 638, 639, 640;**  
**257/642, 758, 759, 760, 773, 774, 775**

(56) **References Cited**

**U.S. PATENT DOCUMENTS**

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**OTHER PUBLICATIONS**

S. Wolf and R.N. Tauber, "Silicon Processing for the VLSI Era vol. 1—Process Technology," 1986, Lattice Press, vol. 1, p. 194.\*

Wolf, Silicon Processing for the VLSI Era, vol. 2—Process Integration, 1990, pp. 194, Lattice Press: Sunset Beach, CA.

Primary Examiner—Craig A. Thompson

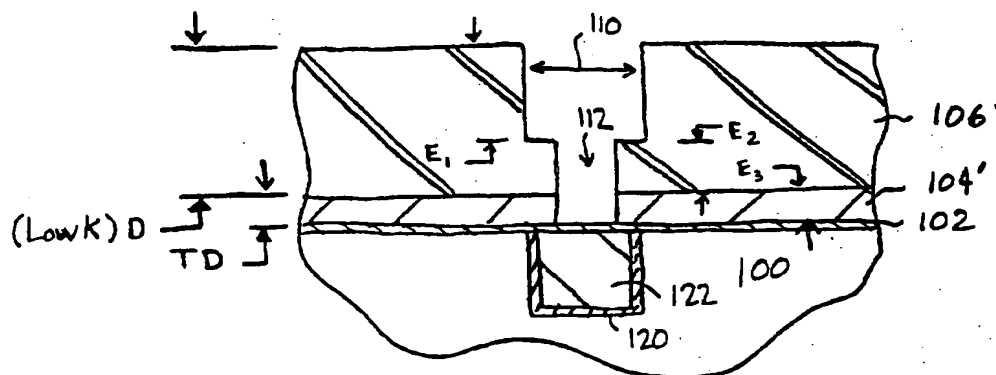
Assistant Examiner—Thanhha Pham

(74) Attorney, Agent, or Firm—Martine Penilla &  
Gencarella, LLP

(57) **ABSTRACT**

A dielectric structure and method for making a dielectric structure for dual-damascene applications over a substrate are provided. The method includes forming a barrier layer over the substrate, forming an inorganic dielectric layer over the barrier layer, and forming a low dielectric constant layer over the inorganic dielectric layer. In this preferred example, the method also includes forming a trench in the low dielectric constant layer using a first etch chemistry, and forming a via in the inorganic dielectric layer using a second etch chemistry, such that the via is within the trench. In another specific example, the inorganic dielectric layer can be an un-doped TEOS oxide or a fluorine doped oxide, and the low dielectric constant layer can be a carbon doped oxide (C-oxide) or other low K dielectrics.

**11 Claims, 7 Drawing Sheets**





**UNITED STATES PATENT AND TRADEMARK OFFICE**

UNDER SECRETARY OF COMMERCE FOR INTELLECTUAL PROPERTY AND  
DIRECTOR OF THE UNITED STATES PATENT AND TRADEMARK OFFICE

MARCH 15, 2006

PTAS

**\*700247947A\***

\*700247947A\*

LIE-YEA CHENG  
MARTINE PENILLA & GENCARELLA, LLP  
710 LAKEWAY DRIVE, SUITE 200  
SUNNYVALE, CA 94085

**UNITED STATES PATENT AND TRADEMARK OFFICE  
NOTICE OF RECORDATION OF ASSIGNMENT DOCUMENT**

THE ENCLOSED DOCUMENT HAS BEEN RECORDED BY THE ASSIGNMENT DIVISION OF THE U.S. PATENT AND TRADEMARK OFFICE. A COMPLETE MICROFILM COPY IS AVAILABLE AT THE ASSIGNMENT SEARCH ROOM ON THE REEL AND FRAME NUMBER REFERENCED BELOW.

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RECORDATION DATE: 11/03/2005

REEL/FRAME: 017306/0515  
NUMBER OF PAGES: 5

BRIEF: CORRECTIVE ASSIGNMENT TO CORRECT THE ASSIGNEE NAME, PREVIOUSLY  
RECORDED ON REEL 010204 FRAME 0461.  
DOCKET NUMBER: LAM1P106

ASSIGNOR:  
UGLOW, JAY E.

DOC DATE: 07/26/1999

ASSIGNOR:  
BRIGHT, NICOLAS J.

DOC DATE: 08/02/1999

ASSIGNOR:  
HEMKER, DAVE J.

DOC DATE: 07/26/1999

ASSIGNOR:  
MACWILLIAMS, KENNETH P.

DOC DATE: 08/03/1999

ASSIGNOR:  
BENZING, JEFFREY C.

DOC DATE: 08/02/1999

ASSIGNOR:

ARCHER, TIMOTHY M.

DOC DATE: 08/24/1999

ASSIGNEE:

LAM RESEARCH CORPORAITON  
4650 CUSING PARKWAY  
FREMONT, CALIFORNIA 94538

ASSIGNEE:

NOVELLUS SYSTEMS, INC.  
4000 NORTH FIRST STREET  
SAN JOSE, CALIFORNIA 95134

SERIAL NUMBER: 09346156

FILING DATE: 06/30/1999

PATENT NUMBER: 6251770

ISSUE DATE: 06/26/2001

TITLE: DUAL-DAMASCENE DIELECTRIC STRUCTURES AND METHODS FOR MAKING THE SAME

DOROTHY RILEY, PARALEGAL  
ASSIGNMENT SERVICES BRANCH  
PUBLIC RECORDS DIVISION

03/03/2006  
700247947

ASSIGNMENT RECORDATION COVER SHEET  
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To: Honorable Commissioner of Patents and Trademarks:

Please record the attached original documents or copy thereof.

1. Name of conveying parties:
- |                      |                           |
|----------------------|---------------------------|
| a) Jay E. Uglov      | d) Kenneth P. MacWilliams |
| b) Nicolas J. Bright | e) Jeffrey C. Benzing     |
| c) Dave J. Hamker    | f) Timothy M. Archer      |

2. Name and address of receiving parties:
- a) Lam Research Corporation  
4650 Cushing Parkway, Fremont, CA 94538  
AND
- b) Novellus Systems, Inc.  
4000 North First Street, San Jose, California 95134

3. Nature of conveyance
- |   |  |
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| <input type="checkbox"/> Security Agreement                     | <input type="checkbox"/> Change of Name    |
| <input checked="" type="checkbox"/> Other Re: Record to correct | <input type="checkbox"/> License Agreement |
- receiving party for non-recordable letter. Reel No. 010204 Frame No. 0461

Execution Dates: July 26, 1999, August 2, 1999, July 26, 1999, August 3, 1999, August 2, 1999, and August 24, 1999, respectively.

4. Application Number or Patent Number: 09/346,156 filed June 30, 1999

The title of the application is: DUAL-DAMASCENE DIELECTRIC STRUCTURES AND METHODS FOR MAKING THE SAME

5. Please send all correspondence concerning this document to:

Lie-Yea Cheng  
MARTINE PENILLA & GENCARELLA, LLP  
710 Lakeway Drive, Suite 200  
Sunnyvale, CA 94085  
Tel. No. (408) 749-6924  
Fax No.: (408) 749-6901

6. Total number of applications and patents involved: 1  
7. Total fee (37 CFR 3.41): \$ 0.00

☐ Enclosed  
☐ Authorized to be charged to Deposit Account No. 50-0805  
(Order No. LAM1F106)

8. To the best of my knowledge and belief, the foregoing information is true and correct and any attached copy is a true copy of the original document.

Date: March 3, 2006

  
Lie-Yea Cheng  
Registration No. 52,732